Exponential Transformations Worksheet

1) Describe the transformations that map the function $y = 2^x$ onto each of the following functions...

a) $y = 2^x - 2$ **b)** $y = 2^{x+3}$ **c)** $y = 4^x$ **d)** $y = 3(2^{x-1}) + 1$

2) Create a sketch of each graph for each equation in question 1. (a table of values may help)

3) Write the equation for the function that results from each transformation applied to the base function $y = 5^x$.

a) translate down 3 units **b)** shift right 2 units

c) translate left $\frac{1}{2}$ unit **d)** shift up 1 unit and left 2.5 units

4) Write the equation for the function that results from each transformation applied to the base function $f(x) = \left(\frac{1}{3}\right)^x$

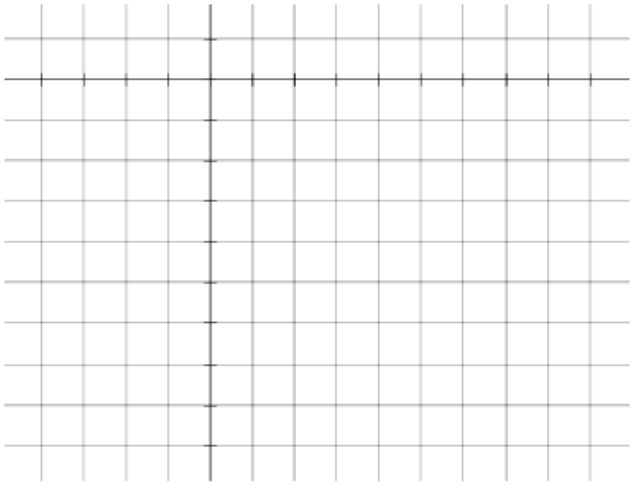
a) reflect in the x- axis (vertical reflection) **b)** stretch vertically by a factor of 3

c) stretch horizontally by a factor of 2.4 **d)** reflect horizontally, stretch vertically by factor of 4

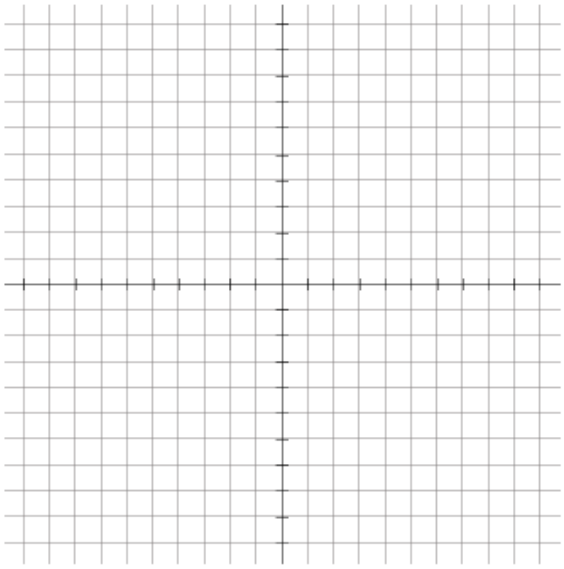
5) Quickly sketch the following exponential functions by transforming the key points and/or asymptote.

a) $y = 3^{x-3} + 2$ **b)** $y = -\left(\frac{1}{2}\right)^x$ **c)** $y = \frac{1}{2}(2^x) - 3$ **d)** $y = \left(\frac{1}{3}\right)^{-2x}$

6) Sketch the graph of $y = \left(-\frac{1}{2}\right) 2^{x-4}$ by using $y = 2^x$ as the base and applying transformations.



7) Sketch the graph of $y = 3^{-0.5x-1} - 5$ by using $y = 3^x$ as the base and applying transformations.



8) Sketch the graph of $y = 3\left(\frac{1}{2}^{-\frac{1}{2}(x-2)}\right) - 4$ by using $y = \left(\frac{1}{2}\right)^x$ as the base and applying transformations.